



Fossil Footnotes

Central Texas Paleontological Society

June 2005

President's Message

By Danny Harlow

Even though this has been a very cool spring, summer and the heat is just around the corner. We are all hopeful the Brazos River level will drop low enough that we can schedule a canoe trip soon.

This is a very busy time for all of us. School is out, graduations and summer vacation travel plans are in the works. Hopeful it will all not get in the way of some very successful summer field trips. The club just completed a well-attended trip to the Brownwood area. It is one of our stable, all time favorites and some nice finds were collected. Ed will have his usual excellent and informative field trip report in the letter.

The monograph by Dr. Sprinkle, Chris Schnieder and Dan Ryder on the Brownwood Spillway will be coming out in the next issue of the Journal. We are all waiting anxiously for the publication. We were shown a preview at the last meeting and it is fabulous.

As we reported Fossil Fest is continuing to take shape. We are close to filling all of the tables. We were also able to add an extra large booth by successful negotiations to acquire a portion of the front room getting us the entrance and kitchen access we used to have. Thanks to Ron

Root. We will still have the display cases on the stage.

Bring some of your recent finds so we can photograph them and get them in future newsletters as the fossil of the month.

See all of you at the next meeting.

Danny

Photo of the month



A cluster of three *Phymosoma texanum* and a *Salenia mexicana* from The Lower Cretaceous Walnut formation of Mills County, Texas.

Collected and prepared by club president Danny Harlow.

June 8th Meeting

We will not have a speaker this month BUT, bring your best stuff and we will have a great SHOW N TELL.

Show and Tell is always an exciting time because we all get to see those great fossil finds that our members have uncovered and just haven't had a chance to show off yet.

We will be at our regular meeting time and place. Be There!!

June 18-19 Field Trip

The field trip on June 18-19 is to Ada, Oklahoma. Directions to the meeting site will be given out at the meeting on Tuesday June 8th and will also be on the website. You can also contact Ed Elliott at 657-7581.

May Field Trip to Brownwood

By Ed Elliott

Around 7:15 AM Sunday morning, Melvin Noble and I ran into Guenther Oswald and Tom Bowers on the side of the road in Goldthwaite. After "Hellos" I said I was going to the Walnut outcrop on the north side of town, where the road makes a left turn. Ten minutes after the four of us arrived at the site, I turned around and we were fifteen. I guess the first stop was in Goldthwaite. After a handful of Phymosomas, Salenias, Heterasters, and lots of other things we all headed on to Brownwood.

Twenty-one of us met at the Mall in Early, talked for a while and then caravanned to the Lake Brownwood Spillway. Dr Sprinkle arrived shortly thereafter. Even though it was overcast, the walk down into the spillway was a lovely sight. Several small waterfalls pouring over the cap rock, pooling below and forming several more small waterfalls dropping on down to the

floor of the canyon. Very nice. The rock here is of the Winchell Formation, Canyon Group. The information I have on the Winchell in detail all relates to counties farther north. In the Brownwood area, all I can say is that the Winchell was a carbonate bank system with a NE-SW trend and was bounded on the east by a carbonate rich "lagoon".

As for what was found-Tom Bowers said he found an almost complete crinoid crown. A good number of the members dug for and found the Archaeocidaris, this location is famous for. Of course, Danny Harlow took some home, as did the Thompsons. I believe the Roots were also successful. There was a good variety of brachiopods and lots of bryozoan slabs. I watched Dr. Sprinkle digging in the Archaeocidaris mudstone and pulling out a variety of fauna: brachiopods, wood pieces and small bits of ferns.

Around noon the consensus was to move on. With this many people, I suggested Wilson Quarry. After rounding everyone up, we started to caravan back to the highway. Luckily Jimmy Hendrix had a slow leak in a tire and we stopped to air it up. I say luckily because it gave Dr. Sprinkle time to catch up. We had left him behind! I honestly had thought he was planning on spending the day at the spillway. My apologies again, Dr. Sprinkle. I do make an effort not to leave anyone behind.

An hour or so after we arrived at Wilson Quarry, (Moran Formation-Pennsylvania/Permian), it started to sprinkle rather heavily. Most of the group headed for home. I say that because I never had the chance to hear what anyone found. I saw Dr. Sprinkle pick up a nice Delocrinus cup. Paul H., Melvin and I stayed all afternoon. Paul picked up a nice cup and Melvin and I picked up a couple apiece. There is such a variety of fossils at Wilson, you can't help but pick up a lot of nice things. I spent my five hours there looking for something new, something specific. As we were leaving, almost to the trucks, I found it. A very nice Parapristis tooth. It made my day.

I hope everyone had a good time despite being rained out. And I hope to see you in Oklahoma on June 18-19.

July Speaker a Real Treat

Dr. Ann Molineux, from the Texas Memorial Museum will be our July speaker. She will present a talk on rudist bivalves at your July 12th meeting of CTPS.

For information about CTPS and our meetings and Fossil Fest, **Visit our Web Site**

<http://www.texaspaleo.com/ctps/index.html>

Minutes May Meeting

By Hollis Thompson

Danny Harlow brought the meeting to order on Wednesday, May 11, 2005.

David Lindberg gave the treasurer's report showing that we are operating in the black. Some money has also come in for Fossil Fest.

We have sold eight small booths and six large booths for Fossil Fest and things are progressing well.

The field trip for Saturday to Brownwood was the next discussion. Because of requests we changed the trip to Sunday with the Spillway the first stop. Meet at the Early Mall on Sunday morning at 8:30 AM. Bring a lunch and lots to drink.

A correction to the newsletter....Regarding the April Field Trip report. It is not Hemiaster but Hemiastrea Sorry Ed. It was late and I am getting old and couldn't see.

Dr. Sprinkle mentioned a paper will be out on this location in a few months. Pennsylvanian (Late Carboniferous Echinoids From the Winchell Formation North Central-Central Texas, USA. Authors Chris L. Schneider, James Sprinkle, and Dan Ryder. It should be out in July 2005 Journal of Paleontology.

Our speaker was Danny Harlow who will be the first to use our new projector....Late Cambrian fossils he found in Texas.

Door prizes were donated by Ed Elliott, corals from the Weches Formation and won by Bill Thompson.

Upcoming Shows

July 7-9, Kemmerer, WY - Fossil Fest. Gem, Mineral & Fossil Show. Triangle Park, Pine Ave. 10-6 daily. 307-877-8859, www.fossilfest.org.

July 23-24, Casper, WY - Natrona County Rockhounds. Casper Gem & Mineral Show. Parkway Plaza Hotel, I-25 & Center St. 23rd, 9-5; 24th, 9-4. Darell Polk, 307-472-5950 or Steve Pfaff, 307-234-9874

Aug. 13-14, Baton Rouge, LA - Baton Rouge Gem & Mineral Society. Gem, Mineral, Fossil, & Jewelry Show. Fraternal Order of Police, Baton Rouge Lodge Number One, 10777 Greenwell Springs Rd. 13th, 10-6; 14th, 10-5. Clara Broussard, 225-687-3864, clara_broussard@hotmail.com.

November 4, 5, 6, 2005 - Fossil Fest Old Settler's Park Highway 79, Round Rock, Texas

2005 Field Trips

Schedule for this year's field trips but subject to change

June 18th-19 th	Oklahoma
July 16 th	Brazos Canoe
Aug 13 th	Non-Vertebrate Lab (UT)
Sept 17 th	Midlothian
Oct 15th-16 th	Sulfur/Red River
Nov	Kerrville

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Earth Beat

Excrement and Evolution
By Daniel Pendick

The seas filled with new animals some 570 millions years ago. What made this unprecedented increase in diversity possible? New findings point to an undersea blizzard of animal droppings.

About 570 million years ago, at the beginning of the Cambrian Period, something amazing began to happen. Paleontologists call it the Cambrian explosion.

Rather suddenly, oceans filled up with complex animal life where previously nothing much more ambitious than burrowing worms had lived. Major biological innovations appeared, including animals with skeletons, complex nerve cell networks and pulsing circulatory systems.

But one of the most important Cambrian innovations of all may have been the muscular, one-way digestive tract, according to a team of researchers at Indiana University in Bloomington. Animals with this feature took in food at one end and pushed it through their conveyer-belt-like guts. Out the other end popped compact fecal pellets. And pop out they did-all over the world.

The team, headed by geochemist John Hayes, proposes that fecal pellets played a key role in the Cambrian explosion. At first a drizzle and then a monsoon, the rain of animal dropping transformed the biochemical machinery of the oceans. This opened vast new habitat in the deep ocean for animals to colonize, greatly accelerating the ongoing emergence of animal life on Earth.

The Indiana University study is just the latest attempt to explain the Cambrian explosion, one of paleontology's most enduring mysteries. Fossilized worm tracks and other "trace fossils" show that well before the explosion, the first multi-celled creatures began to slither across the Precambrian seafloor. Paleontologists are pretty sure that a global rise in oxygen made the rise of these first multi-celled animals possible.

For most of Earth's 4.5 billion year history, the gaseous form of oxygen was relatively rare in the environment. Then, in late Precambrian times, oxygen manufactured by photosynthetic algae in the seas, finally began to build up to significant levels. This made a whole lot of things possible that, bio-chemically speaking, weren't before. For instance, there is collagen, a fibrous protein that is the major ingredient of bones and connecting tissues in complex animals. Without an appreciable amount of oxygen around, animals with hard parts, like trilobites and you and me, just aren't possible.

But the rise of oxygen doesn't necessarily explain the Cambrian explosion-only in oceans still ruled by single-celled bacteria and algae. Paleontologists remain at a loss to explain what triggered the unprecedented increase in the diversity of animal life in the Early Cambrian Period.

"Why should that happen?" says Harvard paleontologist Andrew Knoll, an expert in the early history of life. "There is something other than oxygen at work here."

Hayes and his colleagues believe the critical change was in the way organic material was recycled in the oceans. The root cause of that change, they say, was the appearance of animals that packaged their wastes into compact fecal pellets that sank rapidly into the deep ocean.

To reconstruct the biochemistry of the oceans on either side of the Precambrian/Cambrian divide, the scientists used clues culled from minute amounts of fossilized organic material in ancient sea beds. Information about the Precambrian seas came from organic molecules called hydrocarbons, the same stuff that makes up coal, oil and natural gas.

These particular hydrocarbons were made of the decomposed remains of algae and bacteria. And critical to the study, they contained telltale signatures of the processes at work in the Precambrian oceans. Specifically, they were enriched in a particular form of carbon, an isotope called carbon-13. This seemed odd,

because algae should be depleted, not enriched, in carbon-13. Something, the scientists reasoned, must have happened to the algae before they reached the seafloor and became part of the sediments. There is one common process known to cause carbon-13 enrichment: the breakdown of organic matter by oxygen-using bacteria—not just once, but many times. This heavy “reworking” breaks organic material into simpler and simpler molecules, enriching them with carbon-13 along the way.

This told the scientists something important about the Precambrian ocean. The bodies of the algae must have been heavily decomposed by the time they reached the seafloor. In other words, there was a whole lot of rotting going on. And because tiny algae would have sunk very slowly, most of the rotting was going on in the first few hundred feet of the ocean.

Here, according to the Indiana researchers, photosynthetic algae flourished, using sunlight to manufacture usable energy. In the process, the algae released oxygen. Over time, this oxygen should have seeped into the deeper ocean. But it didn't. As bacteria decomposed algae near the surface, they consumed most of the oxygen produced by the photosynthetic organisms. And with most of the oxygen sucked dry, the much greater volume of deep ocean water remained oxygen free.

Then in the Early Cambrian, everything changed, the researchers say. Coelomates, those creatures with conveyor-belt guts, appeared. They grazed on algae, packaging the resulting roughage into heavy pellets that sank quickly through the swarm of bacteria. This left a distinctive trace in the ancient sea floor rocks: hydrocarbons depleted, rather than enriched, in carbon-13. This chemical trace is characteristic of living organisms. That means that the remains of the algae were transported from the surface to the seafloor relatively quickly, before bacteria had a chance to rot them. As in the modern oceans, fecal pellets could have performed this service.

So, in the Early Cambrian, the hail of dense animal droppings began to overtake the gentle

rain of dead algae. This slowed the rotting of organic matter near the surface and consequently the consumption of oxygen by bacteria. Oxygen infiltrated the deep ocean, opening virtually all of Earth's vast marine habitat to oxygen-breathing life. For the evolution of animal life, it was like throwing gasoline on a smoldering fire.

Of course, like previous attempts to explain the Cambrian explosion, this one will have to answer the questions of skeptical colleagues. Knoll, for instance, lauds the Indiana scientists for their innovative chemical sleuthing but isn't buying into their conclusions just yet. They need more evidence to back up their claims. “If it were a company, I wouldn't invest in it,” he said.

Such skepticism won't surprise anyone who has studied the earliest stirring of animal life. Most evidence from the Precambrian consists of faint chemical traces mined from some of the oldest rocks in the world. Regardless, new ideas about the Cambrian explosion seem to sprout as fast as new trilobite species once did. And just in the past five years, Knoll says, the amount of information about the early history of life has grown tremendously.

So what triggered the Cambrian explosion? Knoll is clear on one point: The answer won't likely be a simple, two-word declaration of “fecal pellets”. The evolution of coelomates was probably only one of a constellation of biological and environmental changes that reinvented life on Earth.

“Whether we will ever single out one factor that made it all happen to the exclusion of others,” Knoll says, “is extremely doubtful.”

Stamp Collecting

Mark Lindberg is collecting stamps; a good, clean, cool, summer project. Hollis gave him a large bag full of stamps, some many years old.

Help him out by collecting stamps and taking them to the CTPS meetings and giving them to Mark or David.